

Wetland Restoration in Alberta: Current Status and Future Potential

Summary Report of a
Forum Sponsored by Alberta NAWMP

March 5, 2013

Leduc, Alberta



About the Alberta North American Waterfowl Management Plan Partnership

The North American Waterfowl Management Plan (NAWMP) is an international partnership involving Canada, the US and Mexico working to sustain abundant waterfowl habitat. The Alberta NAWMP Partnership (Alberta NAWMP) is the regional representative focused on local actions in Alberta. Alberta NAWMP consists of federal and provincial government representatives as well as non-government organizations. Alberta NAWMP conserves and protects Alberta's wetland resources and associated upland habitat. With the support, resources, knowledge base and experience of its Partners, Alberta NAWMP employs a unique and successful approach to wetland and waterfowl conservation.

For more information about the NAWMP Partnership, contact:

Michael Barr, Alberta NAWMP Coordinator
RR#2, Camrose, Alberta T4V 2N1

Phone: 780.608.8104

Email: m_barr@ducks.ca

Or visit www.abnawmp.ca

About this Forum

The Alberta NAWMP Partnership facilitates discussion forums, providing a space for professionals to focus on collaborative and engaging dialogue. This opportunity fosters sharing of ideas, enhances knowledge and builds upon years of experience and wisdom among those working in fields related to wetland protection and management.

In March 2013, 78 wetland professionals participated in a forum to discuss the topic *Wetland Restoration in Alberta: Current Status and Future Potential*.

Speaker presentations are available on the Alberta NAWMP website. The forum organizers distributed a short on-line survey asking participants to evaluate the forum. The results of that survey are also available on the Alberta NAWMP website.

Acknowledgements

The Alberta NAWMP Communications Sub-Committee was very focused in its efforts to organize and deliver this forum and their hard work is greatly appreciated. The speakers and panelists, who enthusiastically shared their knowledge and expertise with forum participants, are recognized for their significant contribution to the forum's success. Kim Sanderson is also acknowledged for her help in preparing this summary report.

Contents

Executive Summary	4
Opening Remarks.....	5
Forum Format	5
Why wetland restoration?	7
Current Policy Guidance on Wetland Restoration.....	9
Successes and Challenges in Implementing Wetland Restoration in Alberta	11
Panel Discussion: Past, Present and Future Connections to Wetland Restoration	13
Break-Out Group Discussions	16
Panel Discussion: Exploring Solutions.....	17
Summary.....	22
Appendix A: Forum Participants	23
Appendix B: Break-Out Group Responses.....	25

Executive Summary

In March 2013, 78 wetland professionals participated in a forum to discuss the topic *Wetland Restoration in Alberta: Current Status and Future Potential*. Three speakers described why wetland restoration is important, the current policy consideration related to restoration, and implementation successes and challenges in Alberta. Participants heard municipal, academic, and watershed perspectives on wetland restoration from a panel, followed by a brief virtual tour to look at wetlands on Alberta's landscape. Break-out groups considered how Alberta could increase capacity for wetland restoration, and the priority suggestions were the focus of a larger panel and forum discussion. Key ideas that emerged from this broader discussion of increasing capacity are noted below.

Policy and Legislation: We need a simple, structured policy to encourage industry, government and developers to carry out restoration.

- Develop progressive, clear policy and legislation that encourage industry, government and developers to restore wetlands in a way that satisfies the interests of an educated public.
- Create an implementation plan to operationalize the policy.
- Enforce provincial legislation.
- Integrate provincial and local land use planning decisions.
- Review the current “voluntary” model of restoration and watershed management.

More restoration agents with supporting education and certification.

- Legally enable more wetland restoration agencies (including municipalities) with adequately funded, certified personnel and clear criteria for restoration assessment and monitoring.
- Revisit (or reduce) the 30-year liability requirement for monitoring restored wetlands (e.g., use conservation easements instead).

Build financial capacity – collect funds from all wetland drainage, charge more for drainage and allow only a small amount of mitigation dollars for non-restoration options.

- Increase cost to anyone who drains wetlands and allow only a small amount of mitigation funds to be used for non-restoration purposes.
- Link development charges to distance from wetlands to encourage proponents to reduce wetland disturbance.
- Establish a mechanism to ensure long-term funding for restoration.

Develop municipal conservation partnerships.

- Enable municipal partnerships (similar to conservation authorities) to manage and restore wetlands on a sub-watershed basis.
- Assist smaller municipalities that lack resources to oversee restoration in their jurisdiction.

Develop a better understanding of land economics and ecosystem services of wetlands.

- Establish market-based incentives for landowners to (retain and) restore wetlands and the ecosystem services they provide.
- Improve landowner compensation for (retaining and) restoring wetlands (e.g., through taxes, costs borne by public and developers).
- Accurately assess hydrology and wetland resources on land titles so changes can be documented.

Opening Remarks

Wayne Crosby, Chair of the Alberta NAWMP Communications Sub-Committee, welcomed participants to the forum (see Appendix A for a list of attendees). He briefly described the agenda for the day and provided a short overview of NAWMP. Based on feedback from the last forum in November 2012 and input from various NAWMP members, and consistent with NAWMP's vision, wetland restoration was identified as an important topic of interest.

Considerable work is underway on policy and implementation activities related to wetland restoration; the aim of this forum was to bring these ideas together and consider how we can build capacity in the area of wetland restoration.

Wetland restoration refers to the restoration of **drained or altered naturally occurring wetlands**. We also recognize the possible range of constructed or partially constructed wetlands and their associated terminology (rehabilitate, reclaim, replace, renovate, remediate, etc.). The desired outcomes for this forum were to:

- increase awareness and knowledge on wetland restoration, and how it fits within the broader wetland mitigation framework;
- share experience and knowledge through learning; and
- identify opportunities for further development of restoration capacity.

The immediate aim of the forum was to identify and discuss the challenges and opportunities to increase capacity for wetland restoration in Alberta.

Forum Format

This forum used a combination of approaches to present information and engage participants. In addition to a virtual tour of Alberta to show wetlands on the landscape, the forum featured conventional presentations, two panel discussions, and a breakout session where participants were asked to consider the question: *How can the capacity for wetland restoration be increased in Alberta?* Each group submitted one or two key recommendations, solutions or questions that they would like to see addressed in more detail by a panel and by the forum at large. These were consolidated into 12 points, which were voted on by all participants using iClickers™. The top five choices were then the focus of discussion for the second panel. All ideas transcribed from the breakout groups appear in Appendix B, as do the voting selections for each of the 12 suggestions that emerged from the breakout groups.

To introduce the use of iClicker™ technology, the organizing committee drafted seven questions about wetland restoration. The responses, not surprisingly, indicated a high level of existing knowledge and awareness among forum participants. These initial questions and iClicker™ results appear below and the correct choice is indicated in bold text; not all participants voted on every question. A number of these questions are discussed in more detail in the presentation by the first speaker, Dr. Lee Foote.

There are no substantive differences between wetland restoration and wetland creation

True 1 **False 63**

Wetland restoration of a non-permanent (seasonal) basin is administered and regulated under?

- A. Municipal Government Act 3
- B. Public Lands Act 0
- C. Water Act 31**
- D. Federal Wetland Policy 1
- E. A combination of the above 38

Wetland restoration is a mandatory outcome of wetland mitigation frameworks for all wetland-related development proposals?

True 20 **False 53**

Wetland restorations under wetland mitigation frameworks require greater area than lost because of:

- A. Uncertainty of success 2
- B. Time lag (temporal loss of functions) 2
- C. Restoration presumed inferior to the original wetland 7
- D. Some combination of the above 62**

Which is the primary determinant of successful wetland restoration?

- A. Hydrology that supports wetland function? 60**
- B. Wetland soil development? 4
- C. Stable suite of wetland plants? 8
- D. Wetland vertebrate colonization? 2

What proportion of the suite of biota must be present before wetland biodiversity is successfully restored?

- A. 0 % 1
- B. 50 % 20
- C. 75 % 31**
- D. 100% 21

What time frame is realistic for the return of the majority of wetland functions in a restored marsh wetland in Alberta?

- A. Months 6
- B. Years 49**
- C. Decades 19
- D. Centuries 0

Why wetland restoration?

Dr. Lee Foote, University of Alberta

Considerable confusion exists around various “R-terms”: restore, reclaim, remediate, renovate, and others. Wetland “restoration” can be defined as “bringing a wetland and its original values back into existence at the same site following its elimination (drying, draining, filling or severe alteration).” The two key parts of this definition are the phrases *original values* and *at the same site*.

There is in fact a substantive difference between wetland creation and wetland restoration. Restoration is a return of wetlands to a prior landscape position, hydrologic regime, and may benefit from remaining evolved soil types, seed banks, and microorganism fauna. These make restored wetland success more likely than establishment of newly created wetlands. A whole suite of wetland values exists that we cannot see (e.g., carbon capture, groundwater recharge, turbidity reduction through a series of beaver pond wetlands); it is hard to put a price tag on these but they add value to society as a whole.

The rest of this presentation aims to make the case for why wetland restoration is needed. It also looks at some of the indicators of restoration success.

Restoration is needed to recapture the values that wetlands provide for human benefit and to reverse the many sources of wetland loss. Wetlands can be lost and damaged due to:

- Local excavation for water capture and holding. This is done mostly to provide dugouts for fish ponds and cattle watering, and represents a net loss of productivity. Dugouts comprise only water that is concentrated for single use.
- Water energy erosion from land use alteration and resulting artificial flows. Flow rates can be damaging and the question is how to manage the landscape.
- Fill deposition for development. This can be associated with infill for residential, commercial or industrial development.
- Excavation, redistribution of wetland sediments, and land levelling.
- Channelization, road construction, erosion and sediment infill, which can lead to substantial sediment loads moving down into water.
- Land re-contouring and removal of stabilizing vegetation.
- Plowing into the littoral zone; mobilization of sediments in runoff, and wetland filling. This happens when farming occurs close to wetlands and with storm runoff. Artificial over-stabilization of hydrology and invasive plants. This can happen in irrigated areas when irrigation water moves in; these are not natural wetlands and have only moderate to low diversity.
- Salinization, resulting from interruptions to shallow groundwater flow.
- Direct effects of livestock on wetland structure, vegetation, and nutrients.
- Indirect effects of livestock, such as hyper eutrophication from runoff.

A great deal of information is needed to effectively restore a wetland, including details about the site history, topography, hydrologic regime, soil types and others. We need to know what we are restoring toward.

The primary determinants of successful wetland restoration are hydrology and wetland soils. These are the most problematic and they set the stage for subsequent floral and faunal colonization. It is essential to get the soils and slopes right and to manage the water regime.

It can be difficult to know when wetland biodiversity has been restored successfully; for example, beavers could initially get into sub-optimal areas but not persist. Biological indicators are not perfect and represent a judgement call, but are often used to measure success. For example, in my opinion if a wetland has accumulated 75% of the biota (richness, dispersion and biomass) of pre-existing or a nearby comparable wetland within ten years, it is a good candidate for being declared successful.

Another important question revolves around how quickly restored wetlands begin to act like undisturbed sites. The answer is “years.” Some are slower some are faster, but if most are not in place within a decade, we have to question restoration efficiency.

In terms of policy, I like to use the metaphor of a three-strand rope to explain needs for a durable solution to wetland loss. These three strands (or processes) – biophysical, social and decision-making or governance – each comprise about one-third of the story, and the decision process links the first two. If all three components are present, the resulting policy analysis will be much stronger.

Discussion

Q: A lot of water on the landscape due to floods, for example, creates an impact and loss of wetlands. How do we address wetlands that have suffered an impact vs. those that have been lost?

Lee Foote: There is a large natural range of variability, and it is critical for some wetlands to dry out sometimes. With the dugout example, we can measure a more permanent impact. We will probably see impacts due to climate change so we should try to secure as many wetlands now as we can because the long-term prospects don't look particularly good. Variability needs to be accounted for.

Q: The challenge is that even if we can retain wetlands, conditions change around them due to things like stormwater, pollution from street runoff and pet feces, etc. How can this be managed?

Lee Foote: This is mostly a decrease in quality and these tend to be long-term to permanent changes. We have to plan for extremes. If inflows are likely to go over a dike, we need to think about those impacts.

Comment: Climate change might be hard on permanent and semi-permanent wetlands but better for seasonal ones. We need to keep in mind the full range of variability and target multiple types of wetlands.

Current Policy Guidance on Wetland Restoration

Thorsten Hebben, Alberta Environment and Sustainable Resource Development

Alberta Environment and Sustainable Resource Development (ESRD) continues to work on developing a new wetland policy for the province. The Department acknowledges the limitations of the current interim policy and is focused on developing a comprehensive and informed wetland policy for Alberta. This presentation looks at mechanisms that support wetland restoration, relevant restoration activities, the concept and work of restoration agencies, limitations of the current system, and the path forward.

In recent years, Alberta has experienced a significant paradigm shift relative to wetland management and land use priorities. We have moved from a focus on agricultural productivity to more informed and integrated water management, and have shifted from promoting drainage to enabling restoration. Wetland restoration is enabled through Alberta's *Water Act*. Restoration projects are accompanied by a monitoring and maintenance requirement, and most activities that will affect a water body in Alberta require regulatory approval to proceed.

The 1993 Interim Wetland Policy manages mineral wetlands (marshes and shallow open water wetlands) in the White Area of the province. The 2007 Provincial Wetland Restoration/Compensation Guide requires a minimum 3:1 (area-based) compensation for wetland losses, and does not allow for the development of artificial wetlands. It promotes restoration within the same or a nearby watershed and allows for offsite restoration at a 10:1 ratio, but these latter two components have not been consistently successful. The 3:1 ratio is based on the principle of no net loss of wetland area, recognizing that a) some proportion of restoration projects will fail, b) some wetland functions will be lost in the compensation process, and c) there is a time lag between the wetland loss and the time a restored wetland becomes reasonably functional.

Wetland restoration is the re-establishment of a naturally occurring wetland with a functioning natural ecosystem whose characteristics are as close as possible to conditions prior to drainage or other alteration. Restoration is most often done through:

- Re-contouring, in which wetlands are restored to the natural water level through the use of local soils and vegetation. This frequently involves the filling of drainage ditches.
- Engineered wetlands, which may entail earth fill embankments, fixed or variable crest water control structures, and outflow conveyance systems. This type of wetland often spills water to downstream areas during runoff events and is part of the effective drainage area of the larger drainage basin.

The aim of the Provincial Restoration/Compensation Guide is to maximize the benefit obtained from restoration activity. Once a site has been restored, it is monitored annually by the restoration agent. Ducks Unlimited Canada is the primary wetland restoration agency (WRA) in Alberta at this time; the City of Calgary is also a WRA. Other organizations, including municipalities, are interested in becoming WRAs, but limitations in the current system have prevented this. Limitations include the lack of:

- A detailed certification system for WRAs and qualified wetland aquatic environment specialists.

- A mechanism to establish a formal, legally-binding relationship between the agency and the Government of Alberta.
- A comprehensive, integrated management system, including guidelines and criteria for defining restoration areas, restoration and construction activities, and monitoring requirements; information systems; and electronic reporting systems.

Another limitation is the requirement to secure, monitor and maintain the wetland for 30 years, which can be a challenge in the absence of any financial incentive. ESRD is working with the County of Vermilion River on a pilot project to explore new opportunities.

The path forward will address these limitations through the development of standardized tools, integrated data systems, and a certification system for WRAs. These changes and improvements can be made now and will be further enabled under new policy direction.

Under a new wetland policy, Alberta wants to:

- Make the link to wetland value (functional attributes and human benefits) to enable informed management decisions.
- Establish a wetland banking system.
- Enable innovation and continuous improvement by incorporating new science and knowledge into the restoration system, as it becomes available.
- Consider a carbon offset protocol.
- Create incentive programs to encourage farmers to maintain wetlands on the landscape; the matter of compensation remains to be addressed.
- Design enhanced education and outreach programs.

Discussion

Q: If a drained wetland is restored, what happens to the ownership of beds and shores?

Thorsten Hebben: The *Public Lands Act* and the *Land Titles Act* include language to account for water bodies that are not identified in land titles, but it could get complicated if it became a legal dispute.

Successes and Challenges in Implementing Wetland Restoration in Alberta

Perry McCormick, Ducks Unlimited Canada

Ducks Unlimited Canada (DUC) has a 75-year history of wetland conservation programs in Canada, with a strong presence across the prairie provinces. In Alberta, DUC has nine full-time equivalent positions and support staff engaged in wetland restoration projects. DUC partners with landowners, the Government of Alberta and other non-government organizations on various initiatives. At present, DUC is the primary wetland restoration agent (WRA) in the province.

DUC has built a solid decision support system based on mapping, scientific information and tools such as satellite imagery, historical aerial photography, drained wetland inventories and ground truthing. This enables the organization to develop priority areas for planning and delivery. Several principles guide DUC's delivery:

- Wetland restoration is focused on the highest number of impacted basins and presence of perennial cover.
- Upland is restored in conjunction with wetland restoration.
- Implement projects that achieve large block habitat impact and habitat connectivity.

The biggest challenge is accessing land to accomplish wetland restoration. DUC seeks to work on cropland, which is where the greatest restoration needs are, but prices for many crops (e.g., canola at \$15/acre) make it very difficult to get access to this land. The secondary area of focus is grasslands, but drained wetlands are seldom found in these locations.

DUC uses four main tools to secure land for wetland restoration purposes:

- Purchase. Historically, DUC has had access to matching funds in the US, but the current fiscal situation puts that grant arrangement at risk.
- Wetland Restoration Agreement. To date, DUC has been able to offer 80% of fair market value (fmv) to restore a wetland, but uptake has been very poor as the energy sector can pay 400-500% of fmv. DUC will be testing 150% of fmv in coming years.
- Conservation Easement Program. With this tool, the landowner receives 20% of fmv to retain the land as is. The easement stays with the land, which can never be drained or broken. This program has also had poor uptake on the prairies.
- Revolving Land Purchase Program. This unique program arose when DUC received a \$1-million grant from Agrium to restore wetlands, protect a restored wetland with a conservation easement then sell the protected land back to the agriculture sector. This is usually done at a small loss, but the funds from the sale can then be reinvested into a new revolving land purchase.

Various tools for restoring wetlands are available, including the use of ditch plugs and engineered structures. In irrigated areas, efforts are underway to decommission or naturalize created wetlands.

DUC's wetland restoration program has been successful at the project scale, but loss continues and an effective wetland policy is needed to protect wetlands and foster additional restoration.

The key driver for DUC as the primary WRA in Alberta is the requirement that restored wetlands must be secured for a minimum of 30 years. The WRA process includes the following steps:

1. Upon request from proponents, DUC provides replacement proposals.
2. Proposals are in the same major watershed at 3:1 ratio, costs are based on the format on the guide and local land prices.
3. Proponent pays DUC when they get their approval, and DUC deposits funds in a deferred revenue account.
4. Once wetland restoration activity takes place for that approval (2 to 3 years) the funds are allocated to the DUC project.
5. DUC reports to ESRD on an annual basis the specifics of approvals and offsetting wetland restoration replacement.
6. DUC has available to ESRD as-built plans and survey data for audit purposes.

The greatest challenges in DUC's wetland restoration program are:

- Opportunities – staff capacity and program fit; for example, many wetlands have been lost in and near urban areas where land is very expensive, making it hard to find other places to compensate. Most of the restoration opportunities are found where the most drainage has occurred.
- 30-year requirement – affects uptake and program options.
- Funding for securement (access).
- Changing policy environment.
- Need for more WRAs.
- Pipeline infrastructure – Alberta has a very large number of pipelines and it is very difficult to get permission from energy companies to restore a wetland over their pipelines.
- Commodity prices.

Discussion

Q: Does DUC differentiate between restoration in compensatory vs. non-compensatory situations when developing programs?

Perry McCormick: Most opportunities come from wetland mitigation. But at this point, we have limited capacity and are unable to do any more.

Q: Not only is the price paid for securement too low, but 30 years is a long time. Could the policy be changed?

Perry McCormick: Under the interim policy, once a wetland is restored, it is protected in perpetuity by law.

Q: Does DUC consider perennial cover as part of wetland compensation?

Perry McCormick: No.

Panel Discussion: Past, Present and Future Connections to Wetland Restoration

The first panel discussion featured four perspectives:

- Municipal (Urban): Chris Manderson, City of Calgary; and Grant Pearsell, City of Edmonton
- Academia: Shari Clare, Fiera Biological Consulting
- Watershed Planning: Dave Trew, North Saskatchewan Watershed Alliance (NSWA)
- Municipal (Rural): Al Kemmere, Alberta Association of Municipal Districts and Counties (AAMDC).

Panelists provided a short commentary from their perspective, and this was followed by a brief question and answer session with forum participants.

Municipal (Urban)

Chris Manderson noted that the City of Calgary began developing its own wetland policy in 2003 to find a way to integrate land use planning with water planning. Wetlands seemed to be “falling through the cracks” and the City wanted better control over how decisions affecting wetlands were made. Consequently, they focused both on how to protect and restore wetlands and on making the appropriate decisions.

The City believes that wetland avoidance should still be a high priority and the municipality needs to be involved in that decision in the first place. The next challenge is what to do with lost wetlands since less and less land is available for compensation purposes. There may be a need to focus on a smaller landscape and to put a value on ecosystem services provided by wetlands. One key issue is stormwater management and wetlands, and the conversion of existing wetlands to managed systems. We need to know more about how to design these systems. Most of this expertise now comes from the development industry and municipalities need to do a better job of having input when these systems are designed and built.

Academia

Shari Clare has focused on wetland policy implementation in Alberta, particularly with respect to issues related to decision making and policy creation. One observation is that the rules don't necessarily align, and there is disparity between what we say in policy and what we do. If Alberta moves ahead with wetland restoration, we need to keep a few things in mind. First, avoidance is key to any mitigation framework. Compensation and restoration should be a last resort, and we often lose sight of this. Second, once we decide to go to compensation, we need a system that is a lot more transparent as to how decisions are made, and the information that supported those decisions should be publicly available and easily accessible. In my experience, it is exceptionally hard to get access to wetlands approval information, such as wetland impact and compensation location, wetland class, and compensation ratios. The only way to ensure accountability is to ensure that information is accessible.

Another major finding is that Alberta has a significant enforcement and compliance issue. Working with a colleague, we have tracked anthropogenic wetland loss over a ten-year period. We estimated a loss of more than 250 hectares in the Beaverhill sub-watershed between 1999

and 2009, and compared this to the number of approvals issued over the same time period. Preliminary results suggest that more than 70% of losses appear to have been done illegally, without *Water Act* approvals. The reason we are talking so much about wetland restoration is because we have a serious wetland loss problem.

Watershed Planning

Dave Trew noted that the NSWA is working on an integrated watershed management plan for the North Saskatchewan River and is dealing with very diverse issues. A multi-stakeholder collaborative process provided direction at a very high level. The Vermilion River plan reflected heavy municipal influence, and it's clear that municipalities will be a key part of implementation. The NSWA is starting to advocate for municipal watershed partnerships. Municipalities have a clear mandate through the *Municipal Government Act*, but haven't had a lot of support to deliver on this mandate.

In general, the roles and responsibilities of municipalities in current government policy are not clearly articulated and considerable work remains to be done at the local scale. Sub-watershed management is not systematically organized by basin, and we need sub-watershed management agents. Many of the issues could and should be integrated and managed through sub-watersheds; we just need appropriate mechanisms to do it.

Municipal (Rural)

Al Kemmere observed that the problem is one of education – municipalities have some responsibilities for wetlands but don't have enough jurisdiction, education or understanding to do the job that needs to be done. The AAMDC takes direction from members at their conventions through resolutions. The organization recognizes the importance of managing water through conservation and protection. Flooding and erosion are major issues for rural municipalities, which need funding as well as inter-agency coordination to manage many of these water-related issues. Municipalities also need a better understanding of what bodies of water are and what restoration really means.

AAMDC has a resolution on wetland restoration, and is of the view that municipalities should be enabled to undertake wetland restoration, recognizing the need for technical expertise. Compensation is also an important issue. For years, farmers drained wetlands for economic purposes, with government support. This approach is changing and, because the public will benefit from wetland retention and restoration, the public should help cover the cost to farmers. Another resolution notes that municipalities should be exempt from restoration if the land involved in road construction is less than one hectare.

Discussion with forum participants

Q: The Calgary-Edmonton corridor is losing a lot of prime agricultural land. How do we balance wetland policy with other competing demands?

Grant Pearsell: It's not so much policy but enabling legislation. We don't have legislation that allows us to protect wetlands. We can do it when land is subdivided, but it's a long process between the time land is earmarked for development and the time it is subdivided. In between,

savvy developers know they can get approval to drain before the municipality gets a chance to apply its policy. The Government of Alberta needs to focus more on avoidance.

Chris Manderson: We compensate for loss, ending up with unsustainable wetlands around cities. We need to mesh decisions on wetlands with land use planning earlier on; there are opportunities, but they are found in many acts.

Al Kemmere: For a while in my own county, any time someone wanted to subdivide and had environmentally significant land (e.g., riparian, wetland) on that quarter, they had to fence off those areas and protect them. We passed about 25 subdivisions with those conditions and the political backlash was huge. We didn't do a good job educating people about the reasons for the policy, and that undermined it.

Grant Pearsell: We are not hearing enough about land economics and its importance in preserving wetlands. Compensation rates are very low and are a fraction of what it would cost to do it in Edmonton or Calgary.

Q: Groundwater loss in rural municipalities is a big issue. We can't keep freestanding water if the water table is lowered by 1-2 metres. Where do we put our limited dollars – in municipalities or in broader agricultural areas? Can we live with loss in cities as long as there is more conservation in rural areas?

Chris Manderson: The City of Calgary is looking at the compensation funds it has and wants to invest strategically in our watershed. We have to accept some basic changes in ecosystems once they are urbanized, but we can maintain water quality, keep water off the landscape and connect people to wetlands and the natural world.

Shari Clare: We tend to underestimate the value of planning. The usual approach to municipal design does not allow room for creative planning – it's more related to legal and other requirements. If we do not prioritize avoidance over compensation, it sets the stage for a different kind of thinking. If we were more creative, we could get higher functioning wetlands than we have now. These need to meet part way.

Comment: The City of Calgary pushes for creative design, but it is often monopolized by one or two developers and planners. This is not the City's prerogative. The City is not saying something is too risky; it's the people who are designing the development who don't come in with innovative solutions. Even if the City doesn't like it, it often still gets pushed through, sometimes at the Council level.

Grant Pearsell: Part of the problem is the important need for community flood protection and the measures that are required to meet that need.

Break-Out Group Discussions

In pre-assigned break-out groups, participants discussed the question: *How can capacity for wetland restoration be increased in Alberta?* Groups recorded the questions, recommendations and solutions from their discussion and selected one or two that they would most like the panel to discuss.

The priority ideas were compiled into three groups of four each, and participants then had an opportunity to use the iClicker™ technology to select the top five topics for the panel discussion.

Group 1:

- A. Education – help the public understand that restoration is for their good.
- B. Raise compensation ratios – proponents pay more.
- C. More wetland restoration agents – better incentives, shorter liability term, certification process.**
- D. Policy – we need a simple, structured policy to encourage industry, government and developers to carry out restoration.**

Group 2:

- A. Build financial capacity – collect funds from all wetland drainage, charge more for drainage and allow for only small amounts of mitigation dollars.**
- B. Stakeholder engagement – on incentives or disincentives to wetland drainage.
- C. Develop municipal conservation partnerships.**
- D. Practical ways to engage all players; i.e., landowners, developers, municipalities.

Group 3:

- A. True cost accounting to generate more revenue to increase capacity for more resources and staff at all levels of government.
- B. Develop a better understanding of land economics and ecosystem services of wetlands.**
- C. Ensure legislation works together at all levels of government.
- D. How can AB NAWMP help build capacity for wetland restoration?

The top two topics from groups 1 and 2 and the top one from group 3, shown in the lists above in bold, were put forward to the panel. The full list of ideas transcribed from the breakout groups and the iClicker™ voting results appear in Appendix B.

Panel Discussion: Exploring Solutions

The second panel discussion involved seven individuals with different perspectives who offered their comments and observations on the priority suggestions selected through the iClicker™ voting process. Although five priority suggestions were selected, time only permitted four of these to be discussed (the suggestion regarding more wetland restoration agents was not discussed by the panel).

The panelists were:

- Shari Clare, Academia
- Thorsten Hebben, Alberta Environment and Sustainable Resource Development (ESRD)
- Al Kemmere, Alberta Association of Municipal Districts and Counties (AAMDC)
- Chris Manderson, City of Calgary
- Perry McCormick, Ducks Unlimited Canada
- Grant Pearsell, City of Edmonton
- Dave Trew, North Saskatchewan Watershed Alliance (NSWA)
- Moderator: Wayne Crosby.

Suggestion 1: We need a simple, structured policy to encourage industry, government and developers to carry out restoration.

Shari Clare: Policy and implementation are not the same thing: having a clear policy doesn't necessarily mean clear implementation. If we don't have clear rules regarding implementation, there will be very little progress. There may be no confusion about the goal or goals of existing policy, but there is confusion about how decisions are made to achieve those goals. Even though everyone might agree and support particular policy statements, we need more harmony between the wetland policy and other existing policies, laws, and regulations.

Perry McCormick: I think the existing policy is simple and clear as it pertains to the White Area; we simply need to address the Green Zone.

Thorsten Hebben: I would say it depends on the definition of policy. Policy won't enable Wetland Restoration Agencies (WRAs), for example. Alberta has many groups with restoration capacity; they may just need more resources or training. I would call this "operational policy." We need to enable restoration capacity (e.g., through a certification process) to move things ahead. So I don't think it's a policy issue. The interim policy is equipped to do what it needs to do, but we don't have the underlying pieces to make it happen. We need to identify and enable components to put WRAs in place.

Grant Pearsell: The City of Edmonton has confronted this many times. A municipality may have a policy but it will always be trumped by provincial regulation if there is a difference. And there can be many acts that are not aligned. Then we end up getting into case law.

Dave Trew: It would also be helpful if wetland policies were developed and implemented in the context of local sub-watershed management.

Wayne Crosby: Clearly policy is important, but we need to take a “big picture” perspective and think about what implementation looks like on the ground.

Discussion with forum participants:

Q: Sometimes, we have to balance areas where we have high knowledge with areas where we might see high risk, and perhaps move toward being more prescriptive. With wetlands, I see both situations. The panel talked about conflicts between regulation and policy. How do they see this evolving? Will we become more prescriptive or more flexible?

Al Kemmere: I like the outcomes-based approach. Setting policy for wetlands across Alberta is hard to do. But we could set benchmarks for different areas and have targets on that basis.

Q: When you are aiming to reach a regulated number, then what happens? From a land use perspective, could you look at other options such as a performance-based approach?

Grant Pearsell: The City of Edmonton looked at performance-based zoning, but implementation would be a lot more costly and a higher level of knowledge was needed to administer this approach. Administratively, it would not work.

Shari Clare: It comes down to tradeoffs. Right now we don't have the information needed to make informed tradeoff decisions, such as balancing economic and environmental interests. When we try to balance competing interests, we make a lot of decisions in a vacuum without coordination. We need to have public discussions about how such tradeoffs should be made.

Chris Manderson: This has been called the “tyranny of small decisions.” Each decision is made in isolation, but cumulatively, all decisions can create a big change in direction. The City of Calgary tries to give developers some flexibility to reach a reasonable balance; sometimes developers make decisions based on things the City does not know, and Council similarly can make decisions based on its own information. As a result, it can be very hard to work out how actual decisions were made.

Grant Pearsell: Developers and proponents also like some degree of certainty and predictability when they make investment decisions.

Thorsten Hebben: I think the direction we are headed is a hybrid of what we're talking about here. We're looking at some level of outcomes-based management and some degree of direction; e.g., proponents will be expected to pay a certain compensation ratio for wetlands on land they want to develop. Compensation is somewhat outcomes-based. Stakeholders have said that restoration must occur as close as possible to the area of loss, so that would be a requirement. Some restoration could be done near the original site and some elsewhere. We have tried to encourage innovation and discussion and negotiation, rather than have things finely legislated.

Dave Trew: Outcomes from the integration of wetland management within local watershed management could be improved water quality, fish habitat and other aquatic ecosystem characteristics.

Q: How do you capture and articulate all those decisions into an approval so someone reviewing it can see how the Government of Alberta (GoA) made decisions related to a development?

Thorsten Hebben: The rationale would not necessarily be explained at the approvals level, rather it would be determined and expressed in a guidance manual; e.g., “here are the formulas and how they are derived” so the approval writer could make the decision. The intent is that not a lot of interpretation is required.

Shari Clare: This really speaks to accountability. If the GoA creates a new policy framework, we have to be able to measure success and the GoA needs to be mindful of this. If the public demands some accountability, the decision makers need to be able to deliver it.

Comment: A negotiated outcome is hard to document.

Comment: We have many prototypes now about how decisions are made – arbitration panels and others lay out evidence for and against, and give reasons for their decisions.

Suggestion 2: Build financial capacity – collect funds from all wetland drainage, charge more for drainage and allow only a small amount of mitigation dollars for non-restoration options.

Comment: We heard that 70% of wetland loss is not through approvals. That is a concern and these developments need to go through that process.

Chris Manderson: The City of Calgary compensation rates are the highest in Alberta, but this did not prevent wetland loss. Writing a cheque is cheaper and a great deal easier than going through the approval process. Doing your own mitigation on site also takes a lot of time. We need to charge an honest amount for wetland loss and use the dollars more effectively to help balance loss.

Grant Pearsell: The cost to drain or fill a wetland is about 1/100 of the cost to keep it. The cost to restore is not adequate, so overall the financial aspect is not well thought out. These are the two big pieces. Compensation should reflect land value, then there would be less incentive to drain. And how much does it cost to do the restoration? For developers, time is money and anything that takes a lot of time is costly.

Perry McCormick: The elephant in the room is whether producers will be held accountable to the same set of rules as industry and developers are. This must be collectively addressed and the political will does not seem to be there to do it.

Al Kemmere: I would agree with Perry. If we look at charging a lot more for drainage, that activity will be driven underground. It won't happen close to a highway or during the day, but will be done covertly. It boils down to the economy vs. the value of ecosystem services that wetlands provide. If farmers don't see a value in keeping wetlands, they won't consider avoidance or restoration.

Shari Clare: The other component is our ability to finance restoration and the GoA's ability to manage it. In essence, the GoA does not have the capacity to do it all so they need to be able to hire people to manage a restoration system if Alberta is going to have a more complex policy.

Grant Pearsell: The City of Edmonton has moved to a cost recovery model for permitting.

Thorsten Hebben: We are considering that some component of compensation requirements would go to administration related to restoration.

Al Kemmere: Rural municipalities have huge differences in capacity. A small municipality with a population of 5,000, for example, is lucky to have good administrative staff let alone fill other more complex positions. Many of those tasks, like planning are simply contracted out.

Suggestion 3: Develop municipal conservation partnerships

Chris Manderson: The City of Calgary will be around for awhile so has an interest in ensuring that restoration is done well. We have the staff and resources to do what needs to be done. Partnerships need to be clear and consistent in terms of what the rules are, but we often aren't clear about how to work with ESRD in many situations. However, many of the partnerships that ESRD does have in place are solid. Decisions should be made at the local level. Municipalities could look at more user pay arrangements in terms of administrative requirements. We definitely need a way to bridge the provincial-local gap.

Grant Pearsell. I agree. Developers would like decisions to be made at the local level and to make their contributions at the local level.

Dave Trew: The North Saskatchewan Watershed Alliance will be working in three regions of the North Saskatchewan River basin to promote inter-municipal watershed partnerships. We are hoping that such municipal partnerships will be supported through the work of Watershed Planning and Advisory Councils (WPACs).

Al Kemmere: The partnership idea is an obvious one. We need to share capacity and spread the benefits and costs over several municipalities. We are setting up a local land trust to engage the public in agricultural and environmental conservation but this is in the very early stages. WPACs are already a successful partnership involving municipalities, the province and others.

Grant Pearsell: Edmonton is looking at the notion of a non-profit company dedicated to restoration within a regional boundary. The question then is how to fund it. For cities and large towns, it would likely be necessary to group up to a more regional approach.

Comment: Partnerships will be part of the place-based approach being taken by the GoA for lake, basin and land use planning.

Comment: There are many opportunities for municipalities to partner with non-government organizations too.

Comment: Capacity is also a big challenge for small urban municipalities. Eighty percent of the members of the Alberta Urban Municipalities Association have a population of 5,000 or less, which means they barely have funds for one full-time staff person. Increasingly, they are being asked to participate in a wide variety of activities and partnerships and many are pushing back. Demands for municipalities to participate in these collaborative processes need to be integrated and well thought out with an appreciation for limited capacity.

Suggestion 4: Develop a better understanding of land economics and ecosystem services of wetlands

Chris Manderson: The value of keeping something in place is always undervalued, and advocating for what is there now is difficult. The bills will come due in two or three decades when ecosystem services have been lost.

Shari Clare: The real challenge is taking the information and developing a policy instrument or mechanism that functions and allows for informed decisions. Just because you put a value on a wetland or ecosystem service doesn't mean that people will be willing to change their practices and accept a payment for restoring or maintaining that wetland. Creating a functioning market for ecosystem services is complex and is a rapidly developing field of study.

Al Kemmere: Money won't get it all done. Developers are gone in two years and people who move in and out don't have the requisite respect or understanding. Agricultural landowners typically will be there in 20 or 30 years or more, so we have to give them a good reason to take care of wetlands.

Grant Pearsell: The ecosystem services concept is still being developed. People intuitively "get it" but it has not been operationalized.

Summary

The desired outcomes for this forum were to increase awareness and knowledge on wetland restoration, and how it fits within the broader wetland mitigation framework; share experience and knowledge through learning; and identify opportunities for further development of restoration capacity. The forum's immediate aim was to identify and discuss the challenges and opportunities to increase capacity for wetland restoration in Alberta.

Participants had many ideas for increasing wetland restoration capacity, but there was a strong sense of urgency around the need for a new wetland policy that provides clear guidance for retaining and restoring wetlands across the province. Partnerships continue to be recognized as an important component of wetland protection, and there was wide agreement on enabling more wetland restoration agents with the credentials and capacity to do the job. Participants also noted the need for stronger incentives to retain and restore wetlands as well as stronger disincentives to drain them. Financial rewards and penalties as well as landowner compensation could be considered. But one of the most important ways to increase wetland restoration capacity is ensuring that the services provided by wetlands are widely known and appropriately valued.

Appendix A: Forum Participants

First Name	Last Name	Agency
Al	Kemmere	Alberta Association of Municipal Districts & Counties
Alain	Richard	Ducks Unlimited Canada
Alan	Stewart	Agriculture and Agri-Food Canada
Andre	Tremblay	Alberta Innovates
Andrew	Schoepf	Alberta Environment and Sustainable Resource Development
Angela	Fulton	Alberta Environment and Sustainable Resource Development
Brandon	Leask	Alberta Agriculture and Rural Development
Brenda	Eeglon	Alberta Environment and Sustainable Resource Development
Brent	Juergensen	Alberta Environment and Sustainable Resource Development
Brett	Purdy	Alberta Innovates
Brian	Eaton	Alberta Innovates
Candace	Vanin	Agriculture and Agri-Food Canada
Carly	Silver	TERA Consulting
Carlyle	Ross	Agriculture and Agri-Food Canada
Carol	Bettac	Alberta Innovates
Chandra	Tomaras	City of Edmonton
Chris	Manderson	City of Calgary
Colleen	Phelan	Alberta Agriculture and Rural Development
Coreen	Bates	Alberta Environment and Sustainable Resource Development
Dale	Soetardt	Ducks Unlimited Canada
Daryl	Watt	County of Vermilion River
Dave	Trew	North Saskatchewan Watershed Alliance
Dave	Mussell	Alberta Environment and Sustainable Resource Development
Dave	Gamracy	County of Vermilion River
David	McKenna	Alberta Environment and Sustainable Resource Development
David	Samm	Battle River Watershed Authority
Diana	Bingham	Alberta Agriculture and Rural Development
Ed	Parke	County of Vermilion River
Erika	Almási-Klausz	City of Calgary
Gavin	Berg	Alberta Environment and Sustainable Resource Development
Glenn	Gustafson	Alberta Environment and Sustainable Resource Development
Grant	Pearsell	City of Edmonton
Jaimee	Dupont	Nature Conservancy of Canada
James	Papineau	City of Calgary
Jason	Cayford	Alberta Environment and Sustainable Resource Development
Jay	White	Aquality Consulting
Jill	Mooney	Ducks Unlimited Canada
Joanne	Mauthner	TERA Consulting
Jocelyn	Thrasher-Haug	Strathcona County

First Name	Last Name	Agency
Joey	Temple	Red Deer River Watershed Alliance
Juanna	Thompson	Alberta Conservation Association
Karen	Raven	Alberta Agriculture and Rural Development
Kiley	Marchuk	Strathcona County
Larry	Kuchmak	Alberta Environment and Sustainable Resource Development
Laura	Polasek	Agri-Environmental Partnership of Alberta
Lauren	Bortolotti	University of Alberta
Lee	Foote	University of Alberta
Lisa	Shauer (Rombough)	Alberta Environment and Sustainable Resource Development
Mark	Heckbert	Alberta Environment and Sustainable Resource Development
Meghan	Soehn	Alberta Environment and Sustainable Resource Development
Michael	Barr	Alberta NAWMP Partnership
Michael	Merrills	Alberta Environment and Sustainable Resource Development
Mike	Watmough	Environment Canada
Neil	Hollands	Alberta Environment and Sustainable Resource Development
Pat	Marriott	Alberta Environment and Sustainable Resource Development
Paul	Harrington	Alberta Environment and Sustainable Resource Development
Per	Andersen	Nature Conservancy of Canada
Perry	McCormick	Ducks Unlimited Canada
Peter	Boxall	University of Alberta
Rachel	Bocock	Alberta Urban Municipalities Association
Randy	Sweeney	Alberta Environment and Sustainable Resource Development
Rebecca	Rooney	University of Alberta
Rhonda	Brett	Alberta Environment and Sustainable Resource Development
Robin	Lagroix-McLean	Lakeland College
Roger	Bryan	Alberta Agriculture and Rural Development
Sharon	Reedyk	Agriculture and Agri-Food Canada
Sharon	Stollery	Alberta Agriculture and Rural Development
Shawn	Elgert	Alberta Agriculture and Rural Development
Stacey	O'Malley	Alberta Land Institute
Stuart	McLennan	Alberta Environment and Sustainable Resource Development
Suzanne	Young	City of Edmonton
Suzanne	Bayley	University of Alberta
Suzanne	Vuch	Environment Canada
Tasha	Blumenthal	Alberta Association of Municipal Districts & Counties
Thorsten	Hebben	Alberta Environment and Sustainable Resource Development
Tracy	Scott	Ducks Unlimited Canada
Vic	Adamowicz	University of Alberta
Wayne	Crosby	Alberta Environment and Sustainable Resource Development

Appendix B: Break-Out Group Responses

How can the capacity for wetland restoration be increased in Alberta?

Questions, recommendations, and solutions as recorded in each break-out group

- Pay for ecological goods and services
- Lack of enforcement and political will to enforce
- Policy clarity and certainty – pass the Wetland Policy
- Work with development and city planners at the front end
- 30-year requirement to monitor could be a barrier to remove for restoration agents (ex. covered under Water Act?)
- Harmonization and clarity between Acts: Public Lands, Water, etc.
- Increase social knowledge (education and outreach) on this topic
- Work at local levels as well as higher levels

- Charge more for draining wetlands (increase avoidance and increase funds)
- Allow for only a small percentage (10%?) of mitigation dollars for non-restoration options; e.g., education, mapping
- Improved awareness and enforcement to ensure impacts to wetlands go through the mitigation process; i.e., no unauthorized loss
- Ensure 3:1 mitigation ratio is enforced (better consistency and transparency)
- Proper funding of personnel to implement mitigation process
- Foster additional agencies for wetland restoration; e.g., using (as one solution) conservation easements to cover the long-term protection of restored wetlands
- Consider tax reduction for wetland areas on land – more philosophical – sends right message

- Develop a systematic municipal-led initiative that deals with issues on a sub-watershed basis (watershed board?)
 - Closest to the ground, supported by WPACs, provincial objectives/targets, legislation, expert groups
- Conservation authorities – closest to the ground
- Dedicated source of long-term funding – current model is not successful
- Review “voluntary” model of current restoration framework/watershed management – need a dedicated and consistent effort

- Enable more Wetland Restoration Agencies – need criteria
- Wetland Restoration practices and outcomes
 - Criteria (operational practices, guides, manuals) and criteria (assessment)
 - Monitoring, reporting, data accessibility
- Function-based/ place-based enabling legislation
- Water-based education programs – wetlands, surface water, groundwater interactions and linkages
- Payment (and appropriate a priori quantification) of environmental goods and services for wetlands... tax reform mechanisms

- Reduce the need for wetland restoration (WR) through effective wetland legislation
- Over long term, improve education and information transfer across the province in regard to existing restoration successes and challenges
 - Do this at all levels (school children, landowners, stewards, IDs, drainage districts, MDs); communication key
 - Values of wetlands (monetary, social, water quality)
- Improved/increased compensation for restoration/retention
- Clarify ownership of bed and shores of restored wetlands – reduce risk of losing land control by (private land) implementing WR
- Enhance landowner stewardship by recognizing and personalizing WR to the landowner
- Awareness/education/enforcement for retention
- 30-year term restricts other WRAs -> legislation to protect after WR
- Increase financial incentives to landowners for WR -> cost needs to be borne by the general public, as well as developers
- Framework to clarify what a WRA needs to be and how others can become one
- Increase landowners' desire to do WR, by:
 - Increased financial incentives
 - Social acceptance and responsibility
 - Legislation
 - Full cost accounting
- Include WR as part of municipal long term planning

- Charging a market-value rate for the land affected by the development in compensation
- Overcome some of the disincentives for the owners of lands with potential restoration sites, so they can allow restoration
- Find ways to engage the key landowners and developers in the wetland conversation; once they buy in, they will voluntarily move things faster than we can
- Education of agricultural producers on the benefits of wetlands (which outweigh the benefit to producer of that wetland converted to crop) to increase the receptiveness of wetland restoration and maintenance
- Local authority-GoA partnerships for sub-watershed planning
- Provide technical advice and grant programs
- Closed basin needs licence to create wetlands
- Recognize some landowners have strong beliefs about controlling their own land, and distrust government
- Find local leaders (not necessarily elected) to get onside first
- Keep outcome in mind – allow for creativity on how to get there

Capacity is:

- Knowledge base, monitoring data, science
- Political will and enabling legislation, especially to increase the number of restoration agents
- Need centralized regulation and to simplify, so clear to all stakeholders – founded at the municipal level

- Need trained highly qualified personnel and certification as well as success criteria and indicators for restoration assessment
- Policy and regulations to enable
- Need a professional association to enforce standards and audit
- Increase the costs of wetland disturbance -> tie costs to buffer distance; i.e., cost is X\$ if you develop within 30m, but only X/2 if you keep 60m away – thus real economic incentive to avoid

- Education – general public – WR is for public good
- Funding for municipalities that don't have resources
- Get clarity of legislation
 - Jurisdictional roles and responsibilities
 - May need new rules
- Integration of local and provincial land use decisions – harmonize goals
- Recognize municipalities as WRA – need framework to operate
- A tour of DUC restoration sites

- More restoration agencies
- Defined guidelines on what makes a WRA
- Complete the Wetland Policy and update Guide to correspond
- Availability of information
- More leadership from GoA
- Incentives (financial or education)
- Ongoing education at all levels – schools, universities, stakeholders
- GoA needs progressive structured policy to allow industry and developers to carry out restoration to satisfy educated public interests

- Capacity for more resources, staff and knowledge at provincial, municipal, federal levels – Green taxes
- Create incentives for landowner use of wetlands as their land – incentives built into the Wetland Policy
- Public education – more government programs allocated to education
- Informed leadership
- Redesign government structure to prevent agency capture
- Government revenue; e.g., charge for draining

- How will the movement to Alberta's single regulator affect wetland restoration policy and regulation?
- Can we create a wetland restoration certification process (result = restoration professionals, restoration agents)
 - Increase capacity by enabling more people to carry out the restoration process
- How do we deal with the 30-year liability? Reduce timeline?
- How do we consider landscape-scale wetland connectivity, wetland distribution?
- Develop guidelines and criteria for wetland restoration. What is considered a success, how is that measured, and how can we develop indicators for future management and

monitoring? Can we improve adaptive management for partial success or cases of failure?

- Define regional-based objectives for restoration and preservation; create target
- Place accurate value on wetlands in terms of surrounding land use
- Land is not available for purchase to restore
- Increased compensation indexed to surrounding land use
- More focus should be on avoidance and on conservation ethics
- Accurate assessment of hydrology and wetland resources on land titles in order to document changes

Priority ideas submitted by break-out groups for possible discussion by the panel:

- GOA needs progressive, structured policy to support and motivate industry and developers to carry out restoration to satisfy the interests of an educated public
- Streamline all legislation and policy to protect and promote wetland restoration; e.g., incorporate into zoning, especially in urban areas
- Clean and simplified policy and regulation that enables municipal watershed partnerships to manage wetlands (including restoration), such that their authority is not superseded by pre-emptive provincial approvals to drain
- Increased clarity around current rules and processes
- Highly qualified personnel with certification under a professional association as well as success criteria and indicators to standardize and simplify restoration assessment and monitoring
- Legally enable more wetland restoration agencies to restore wetlands
- Develop criteria for mitigation agents – partner with DUC to train the trainer
- More wetland restoration agencies – expand program
- We believe that Alberta’s restoration capacity is not the issue. It is the ability to enable that capacity limitation to the capacity issue include:
 - The 30-year liability
 - The lack of a restoration certification process resulting in restoration “professionals” or restoration agents
- Increase compensation ratios (proponents pay more)
- Collect funds from ALL wetland drainage and increase financial incentives to landowners to undertake wetland restoration. Retention is still important
- True cost accounting to generate more revenue to increase capacity for more resources and staff at all levels of government
- Land economics and ecosystem goods and services of wetlands – increase revenues toward protection/restoration
- Market-based incentives for environmental goods and services
- Find practical ways to engage all players (landowners, developers, etc.) on what their incentives are to drain or degrade wetlands, and the disincentives they have for preservation and restoration. In essence, stakeholder engagement on incentives and disincentives to wetland drainage
- Charge more for wetland drainage and allow only a small amount (5-10%) of mitigation dollars for non-restoration purposes

- Develop a systematic municipal-led initiative that deals with issues on a sub-watershed basis
- Establish municipal partnership; e.g., conservation authorities
- Work on increasing social knowledge to help ensure continued will to focus on this topic
- Education: help public understand it [restoration] is for the public good
- The City of Edmonton has a lot of policies. We have said that our Environmental Policy is important enough that we want to ensure proper implementation. We have utilized a management system that uses an International Standard (ISO14001). The system uses a plan-do-check-act cycle that addresses a lot of the implementation issue that the panel was discussing.

iClicker™ Voting Results

Recommendations Group 1

- A. Education – help the public understand that restoration is for their good.
- B. Raise compensation ratios – proponents pay mores
- C. More Wetland Restoration Agents – better incentives, shorter liability term, certification process
- D. Policy – we need a simple, structured policy to encourage industry, government and developers to carry out restoration



Recommendations Group 2

- A. Build financial capacity – collect funds from all wetland drainage, charge more for drainage and allow for only small amounts of mitigation dollars
- B. Stakeholder engagement – on incentives or disincentives to wetland drainage
- C. Develop municipal conservation partnerships
- D. Practical ways to engage all players ie) landowners, developers, municipalities



Group 3

- A. True cost accounting to generate more revenue to increase capacity for more resources and staff at all levels of government
- B. Develop a better understanding of land economics and ecosystem services of wetlands
- C. Ensures legislations work together at all levels of government
- D. How can AB NAWMP help build capacity for wetland restoration?

